

Current Status of All Claims in Application/  
Amendments

1 (canceled).

2 (canceled).

3 (canceled).

4 (canceled).

5 (canceled).

6 (canceled).

7 (canceled).

8 (presently amended). The method of Claim 7 35, wherein said solid substrate surface comprises a group selected from oxides, nitrates, metals, semiconductors, polymers with a functional group, and mixtures thereof.

9 (presently amended). The method of Claim 7 35 further comprising contacting said solid surface with the silylating agent prior to said step (a).

10 (original). The method of Claim 9, wherein said solid substrate surface comprises a hydroxide.

11 (canceled).

12 (canceled).

13 (presently amended). The method of Claim 35 7, wherein said metal halide is tungsten fluoride.

14 (presently amended). The method of Claim 35 7, wherein the silylating agent comprises silane, disilane, trisilane and mixtures thereof.

15 (presently amended). The method of Claim 35 7, wherein said thin metal film surface comprises metal-metal halide surface.

16 (presently amended). The method of Claim 7 35 further comprising repeating said steps (b) and (c) to obtain a desired thickness of said metal film.

17 (canceled).

18 (canceled).

19 (canceled).

20 (presently amended). The method of claim 36 ~~17~~, wherein said thin metal film surface comprises metal-metal halide surface.

21 (presently amended). The method of Claim ~~36~~ 17 further comprising repeating said steps (b) and (c) to obtain a desired thickness of said metal film.

22 (presently amended). The method of Claim ~~36~~ 17, wherein said solid substrate surface comprises a group selected from oxides, nitrates, metals, semiconductors, polymers with a functional group, and mixtures thereof.

23 (presently amended). The method of Claim ~~36~~ 17 further comprising contacting said solid substrate surface with the silylating agent prior to said step (a).

24 (original). The method of Claim 23, wherein said solid substrate surface comprises a hydroxide.

25 (withdrawn).

26 (withdrawn).

27 (withdrawn).

28 (withdrawn).

29 (withdrawn).

30 (withdrawn).

31 (withdrawn).

32 (withdrawn).

33 (withdrawn).

34 (withdrawn).

35 (new). A method for producing a solid material comprising a thin film of metal on a solid substrate surface, said method comprising:

(a) contacting said solid substrate surface with a metal halide gas, wherein the metal is selected from the group consisting of tungsten, rhenium, molybdenum, antimony, selenium, thallium, chromium, platinum, ruthenium, iridium, and germanium, under conditions including a temperature from 425 to 600 K sufficient to deposit a layer of said metal halide on said solid substrate surface;

(b) thereafter contacting said surface with a reducing agent consisting of a gaseous silylating agent under conditions including a temperature from 425 to 600 K, such that the silylating agent reacts with metal halide species on said solid substrate surface to form silane moieties at the surface of the substrate;

(c) then contacting said surface with additional metal halide gas under conditions including a temperature from 425 to 600 K such that the additional metal halide gas reacts

with the silane moieties formed at the surface of the substrate in step (b) to form a metal film layer having metal halide surface species;

and thereafter sequentially repeating steps (b) and (c) one or more additional times, whereby in each cycle of steps (b) and (c), the metal halide and silylating agent react to produce a metal film layer having a thickness substantially corresponding to the atomic spacing of said metal.

36 (new). A method for producing a solid material comprising a thin film of metal on a solid substrate surface, said method comprising:

(a) contacting said solid substrate surface with a metal fluoride gas, wherein the metal is selected from the group consisting of tungsten, rhenium, molybdenum, antimony, selenium, thallium, chromium, platinum, ruthenium, iridium, and germanium, under conditions including a temperature from 425 to 600 K sufficient to deposit a layer of said metal fluoride on said solid substrate surface;

(b) thereafter contacting said surface with a reducing agent consisting of a gaseous silylating agent under conditions including a temperature from 425 to 600 K, such that the silylating agent reacts with metal fluoride species on said solid substrate surface to form silane moieties at the surface of the solid substrate;

(c) then contacting said surface with additional metal fluoride gas under conditions including a temperature from 425 to 600 K such that the additional metal fluoride gas reacts with the silane moieties formed at the surface of the substrate in step (b) to form a metal layer having metal fluoride surface species;

and thereafter sequentially repeating steps (b) and (c) one or more additional times, whereby in each cycle of steps (b) and (c), the metal fluoride and silylating agent react to produce a metal film layer having a thickness substantially corresponding to the atomic spacing of said metal.

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